

### **Five Channels Impoundment**

Iosco County, T24N, R06E

Au Sable River watershed, last surveyed summer 2016

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#### **Environment**

Five Channels Impoundment is a 237 acre waterbody located 20 miles west of the town of Oscoda, Michigan (Figure 1) in Iosco County. The impoundment was created in 1912 likely for log storage and transport to mills. The dam is owned by Consumers Energy and is operated as a hydropower facility licensed through 2034. The stretch of Au Sable River impounded is relatively high gradient when compared to other northern Michigan streams. The license agreement oversight is provided by the Federal Energy Regulatory Commission (FERC) and State of Michigan. The storage of the impoundment is 4,700 acre-feet, and the head of the dam is 36 feet. The upper waters of the impoundment reach upstream to the base of Loud Dam, and the impoundment is approximately 2-3 miles long between the dams. Flows from middle Au Sable impoundment dams are used to remodulate flows below Foote Dam, the lower most dam on the Au Sable River mainstream.

Much of the shoreline of Five Channels Impoundment is forested and under the ownership of the U.S. Forest Service (Huron National Forest) or Consumers Energy. As of summer 2016, there were no dwellings on the pond, 4 small docks, and plentiful submergent trees and vegetation. Water depth varies considerably through the length of the impoundment, with deeper water located in the river channel and near Five Channels Dam where over 30 foot water depths are found. Most of the river channel and near-shore environments are less than 12 feet of water. Water clarity can be fairly high at times, and often will be altered by discharge. Based on historical and more recently collected data, there is very little thermal stratification of the impoundment during the summer, and dissolved oxygen readings throughout the water column remain highly suitable to fish. There is no thermocline. There is a small concrete public boat launch maintained near the dam that is maintained by Consumers Power Company. Anglers can launch small to mid sized boats at this site, and there is parking for multiple trailers.

#### **History**

Fisheries survey data for this smallest of Au Sable River impoundments is limited, and no known stocking records exist for the water. General observations by the Michigan Department of Conservation (MDOC) in the 1920s noted prominent vegetation beds and a fish community comprised of darters, shiners, minnows, dace, Logperch, Northern Pike, Pumpkinseed, and suckers. Temperature and oxygen profiles were conducted by the MDOC on Five Channels Impoundment in the 1950s. Limited creel data for this period documented Rock Bass and Yellow Perch as dominating angler catches, and to a lesser extent Rainbow Trout, Brown Trout, Northern Pike, Pumpkinseed, and suckers. It was late in the 1950s when the local sportsmans club requested Muskellunge stocking at the impoundment by MDOC. MDOC had plans to stock Walleye, but in the end, neither species was stocked.

The next aquatic surveys of Five Channels Impoundment were made in the 1990s. Multiple water temperature and dissolved oxygen analyses were made both in 1991 and 1992, in advance of upcoming FERC license agreements. Data again showed a typical riverine environment with good dissolved oxygen readings throughout the water column and little thermal stratification. The temperatures were suitable for a cool to warm water fish community. The Michigan Department of Natural Resources (MDNR) was involved in regional spring fingerling Walleye stocking efforts at this time, including other Au Sable River impoundments. Effort was made to evaluate Walleye production at Five Channels Impoundment. MDNR used two hours of nighttime direct current electrofishing in October of 1996 to capture good numbers of wild Walleye from age 0-2 (particularly age 0 fish). No adult Walleye were captured. Other species collected were sub-legal sized Northern Pike, and some Smallmouth and Largemouth bass. Good numbers of 2-7 inch Yellow Perch were collected, along with low numbers of Bluegill and Black Crappie. Rock Bass were considered common.

A similar electrofishing survey for juvenile Walleye was also accomplished in the fall of 1997 between the MDNR and U.S. Forest Service (USFS). Fair numbers of fish less than 13 inches were collected, represented by age groups 0-3. It was evident that some natural reproduction of this species had been occurring in the impoundment, but information on angler catches of Walleye was sparse. So little was known about this fishery.

Earlier in the spring of 1997, both the USFS and MDNR conducted a joint fish community survey of the impoundment using a number of small and large mesh fyke nets, as well as experimental gill nets. It was during this survey that rusty crayfish were first noted in the impoundment. Relatively small numbers of fish (n=225) were captured in the survey, which may be explained by the difficulty to use survey sampling gear in a riverine impoundment (less efficiency). Game fish species that were collected in relatively fair numbers included Northern Pike, Pumpkinseed, Rock Bass, and Yellow Perch. Fewer numbers of Walleye, Bluegill, Black Crappie, Largemouth Bass, and Smallmouth Bass were captured. The non-game catch consisted of redhorse sucker species, White Sucker, Bowfin, and Golden Shiner. Few large game fish predators were collected except for a handful of larger Northern Pike and Walleye. Panfish catches were considered low for lakes in this region.

### **Current Status**

In 2016 MDNR Fisheries Division conducted a fish community survey at Five Channels Impoundment. Effort consisted of 3 large-mesh trap-net lifts, 9 large-mesh fyke net lifts, 4 small-mesh fyke net lifts, 4 seine hauls, 4 experimental gill net lifts and 40 minutes of direct current nighttime electrofishing. Lead lengths for the larger mesh trap and fyke nets were variable depending on the amount of littoral zone. Sampling effort followed the Status and Trends sampling protocol established by Fisheries Division. The survey was done from June 20-27. Water temperature during the survey ranged from 73-75 degrees Fahrenheit, which is the upper range for conducting a lake survey under Status and Trends sampling criteria. Zebra mussels, rusty crayfish, and Round Goby were noted during the survey, and aquatic vegetation was considered abundant. Round Goby are prevalent in Oscoda harbor, and in the Au Sable River upstream to Foote Dam. As of this survey, we do not know the distribution of goby in other Au Sable River impoundments. The population in Five Channels Impoundment was likely transported by anglers as bait. Lake limnological parameters were recorded in late August of 2016 for Five Channels Impoundment. Secchi disk (measure of clarity) was 9 feet and total alkalinity was 142 mg/L. Water temperature on that date was nearly uniform (72-74F) throughout

the water column in 32 feet of water near the dam. Dissolved oxygen levels throughout the water column ranged from 6-8ppm, which is ample for fish growth and survival.

Twenty-four different species and a total of 3,631 fish were collected during the 2016 survey (Table 1). Species diversity was considered high compared to other northern Michigan lakes and impoundments. Large predator fish including Largemouth Bass, Smallmouth Bass, Walleye, and Northern Pike made up 1% of the catch by number and 13% by weight, while non-game species such as Bowfin, bullheads, and suckers made up 72% of the catch by number and an overwhelming 82% by weight. Many age 0 White Sucker were collected in small mesh fyke nets which skewed the catch by number of non-game fish. The panfish community of Five Channels Impoundment is low in both diversity and quality. Pumpkinseed, Rock Bass, Bluegill, and Yellow Perch were all collected, but not in high abundance. Panfish represented 10% of the total catch and an underwhelming 3% by weight. Other species collected (Table 2) included Mimic Shiner, Blacknose Dace, Blackchin Shiner, Round Goby, Golden Shiner, Bluntnose Minnow, Banded Killifish, Brook Silverside, and Rainbow Trout. Some of these species were found for the first time in the impoundment but were likely present in the impoundment during past surveys but not captured (shiners, dace, minnows, killifish, silverside). Other species such as Round Goby are a new invasive species to the waterbody and watershed, and were noted as common. One species, Black Crappie, had been collected in low numbers in previous surveys but were not collected during the 2016 survey.

Panfish catches were low during the 2016 survey, and similar to past surveys. It is understandable that panfish are not prolific in Five Channels Impoundment since it has both lake and river characteristics. The most common species of panfish found are Pumpkinseed, Rock Bass, Yellow Perch, and Bluegill. No large perch, Bluegill, or Pumpkinseed were collected (Table 2) and age structure analysis reveals that no Bluegill or Pumpkinseed older than age 5 were found. No Yellow Perch older than age 6 were collected. Mortality rates of panfish appear very high, and recruitment to young ages appears low. Again, this may be a result of the lack of nutrients in the impoundment and quick flush rates that strip away production for panfish growth and survival. These species also compete with the forage population and coarse fish community.

Though low in density, the predator population consists of Smallmouth Bass, Northern Pike, and Walleye primarily. Few pike were collected and none were legal size (24 inches). In addition, only three year classes were detected (Table 3). Walleye were captured in low numbers and are likely fish that are produced within the narrow impoundment or are flushed through the upstream dam from other production or stocking sites (i.e. Loud Dam Pond, Alcona Dam Pond). Three large (24 inches or larger) Walleye were collected that were age 10 or 11. This shows that this species, once it recruits to predator size, can live long in the impoundment. The presence of age 0 Walleye (1-2 inches) shows that there still is some recruitment in the impoundment, but survival of the limited production is not enough to support a consistent fishery. Five different age classes of Walleye were detected. Smallmouth Bass were the most prolific of these three predators but were represented by only five year classes (age 1-5). Some legal size (14 inches) fish were present in the survey, but no Smallmouth Bass larger than 15 inches were collected (Table 2).

Non-game fish such as Bowfins, bullhead, and multiple sucker species were prevalent in the Five Channels Impoundment environment. All three species of bullhead could be found there which is not uncommon for an impoundment that has a partial silty bottom and dense aquatic vegetation. Bowfin

were also common and reached lengths up to 27 inches. These are large predators which undoubtedly impact the other species in the waterbody. White Suckers were common but mainly at small sizes (1-2 inches). Two species of redhorse sucker were present, the Silver and Greater. These are likely products of the previous riverine system before dams were established, or possible downstream migrants from upstream impoundments or riverine reaches. Silver Redhorse were very common and reached large sizes (up through 24 inches). These are also species that compete with other fish for limited resources, but provide forage for predators when they are young.

### **Analysis and Discussion**

The 2016 fish community of Five Channels Impoundment may be characterized as having the following: 1) a non-diverse panfish community demonstrating average growth and poor survival to older ages, 2) an average diversity for predators dominated by Northern Pike, Smallmouth Bass, and Walleye, none of which are considered abundant, but all are self sustaining, 3) a prolific non-game fish community composed of bullheads, Bowfins, and abundant suckers which dominated the 2016 fish community survey by both weight and number, 4) an impoundment environment with large amounts of silt and aquatic vegetation, but some spawning substrates for suckers and Walleye at the upper end of the impoundment below Loud Dam.

### **Management Direction**

- 1) The aquatic community of Five Channels Impoundment is complex and should be monitored on a fairly consistent basis. A complete fish community survey should be accomplished every 20-30 years. Effort used during the past fish surveys has not been consistent. Future effort should duplicate the 2016 survey for more comparable results. Five Channels Impoundment has a mix of riverine and lake environments but relatively few wetland areas. Periodic fluctuations from upstream dam operations may impact the aquatic community in the impoundment.
- 2) A good opportunity exists to experiment with stocking spring fingerling Walleye in Five Channels Impoundment. The natural reproduction of this species occurring in the pond is not enough to provide a quality fishery. We prescribe stocking spring fingerlings at a rate of 50/acre (11,850) for three years consecutively, then switching to an alternate year stocking strategy. If possible, these fish should be OTC marked to allow for differentiation in future years between wild and stocked fish. Access is good at this lake, and the anglers we talked with during the 2016 survey try to catch Walleye in the impoundment, but mainly when they are vulnerable in the Loud Dam tailrace. Catches are not large, nor consistent. This stocking has the ability to bolster wild production, and could potentially be discontinued if this occurs.
- 3) Northern Pike and Smallmouth Bass are native to Five Channels Impoundment and important parts of the fish community, despite being found in low to moderate densities. The panfish community here is low, but likely normal for an impoundment with much riverine habitat.
- 4) The non-game large fish community of Five Channels Impoundment is prolific and diverse and includes White Suckers, Redhorse suckers, bullhead, and Bowfin. Bow and spear fishing opportunities are available at this waterbody and this type of activity should be promoted.

5) The standard suite of State of Michigan fishing regulations is appropriate for Five Channels Impoundment and I recommend no changes.

### **References**

Zorn, T.G., and S.P. Sendek. 2001. Au Sable River Assessment. Michigan Department of Natural Resources, Fisheries Division, Special Report 26, Ann Arbor, Michigan.

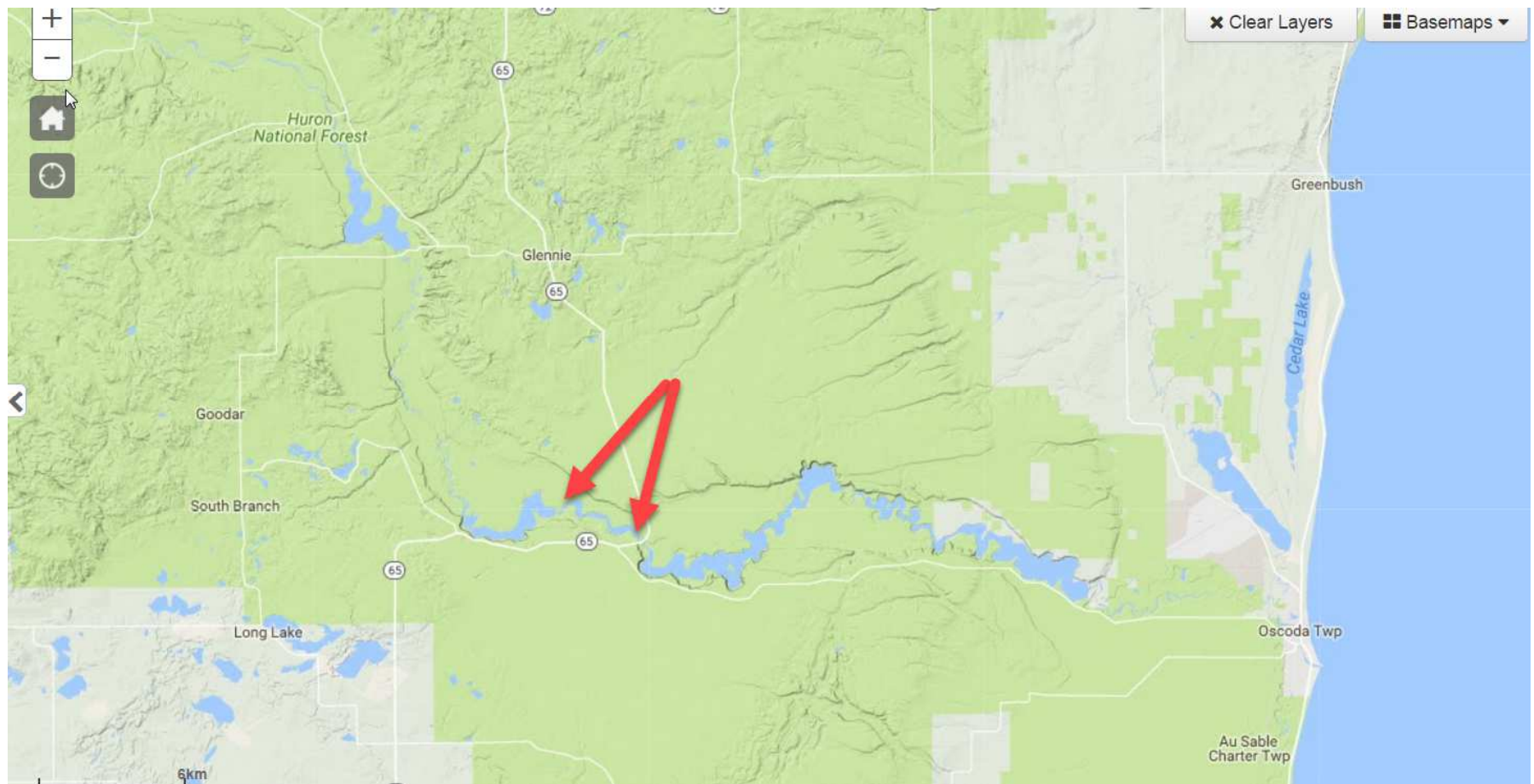


Figure 1. Regional location of Five Channels Impoundment in Iosco County, Michigan. Arrows indicate upper and lower ends of pond . Upstream of impoundment is Loud Dam Impoundment. Downstream of impoundment is both Cooke and Foote impoundments.

Table 1.-Species catch and relative abundance of fishes collected during the Five Channels Impoundment fish community survey, June 20-27, 2016. Weight is calculated.

Species	Number	Percent by number	Weight (lb.)	Percent by weight	Length range (in.)
White Sucker	2,494	68.7	12.7	3.3	1-18
Mimic Shiner	228	6.3	0.4	0.1	1-2
Blacknose Dace	205	5.6	0.9	0.2	1-2
Pumpkinseed	171	4.7	2.3	0.6	1-5
Rock Bass	95	2.6	8.8	2.3	1-9
Bluegill	71	2.0	0.7	0.2	1-6
Blackchin Shiner	70	1.9	0.2	0.0	1-2
Silver Redhorse Sucker	69	1.9	198.4	51.0	10-24
Round Goby	60	1.7	0.0	0.0	1-3
Brown Bullhead	43	1.2	26.5	6.8	6-13
Yellow Perch	26	0.7	2.5	0.6	3-9
Golden Shiner	21	0.6	0.1	0.0	2-3
Smallmouth Bass	20	0.6	20.4	5.3	3-15
Bowfin	18	0.5	72.5	18.7	14-27
Bluntnose Minnow	10	0.3	0.1	0.0	2-3
Northern Pike	9	0.2	13.3	3.4	10-22
Walleye	9	0.2	17.2	4.4	1-24
Black Bullhead	3	0.1	1.1	0.3	7-10
Yellow Bullhead	3	0.1	1.4	0.4	9-10
Greater Redhorse Sucker	2	0.1	7.8	2.0	22
Banded Killifish	1	0.0	0.0	0.0	1
Brook Silverside	1	0.0	0.0	0.0	3
Largemouth Bass	1	0.0	1.3	0.3	13
Rainbow Trout	1	0.0	0.5	0.1	11
<b>TOTAL</b>	<b>3,631</b>		<b>388.8</b>		

Table 2.-Length-frequency distribution of important game fishes collected during the 2016 netting survey at Five Channels Impoundment.

<b>Length (in)</b>	<b>Bluegill</b>	<b>Pumpkin- seed.</b>	<b>Northern Pike</b>	<b>Smallmouth Bass</b>	<b>Yellow perch</b>	<b>Walleye</b>
1	39	52				1
2	28	96				1
3	1	14		1	1	
4	1	7		2	9	
5	1	2			4	
6	1				7	
7				1	3	
8				2	1	1
9				1	1	1
10			1			
11				1		
12				3		
13			1	2		
14				2		1
15				5		1
16			1			
17			1			
18						
19			1			
20			1			
21			1			
22			2			
23						
24						3



Table 3.-Mean length (inches) at age for various game fishes of Five Channels Impoundment. Number in parentheses is number aged. Growth comparison in last column was across all ages.

Species	Age group	2016 June	2016 growth compared to state average
Bluegill	I	1.9 (10)	
	II	3.8 (3)	
	III	5.1 (1)	
	IV	6.1 (1)	
Pumpkinseed sunfish	I	2.1 (9)	-0.6 inches
	II	3.5 (13)	
	III	4.4 (5)	
	IV	4.9 (3)	
	V	5.6 (1)	
Yellow Perch	I	4.3 (8)	+0.1
	II	5.8 (4)	
	III	6.6 (9)	
	IV	--	
	V	--	
	VI	8.5 (2)	
Smallmouth Bass	I	4.4 (2)	-0.2
	II	8.0 (1)	
	III	10.4 (6)	
	IV	13.5 (3)	
	V	15.1 (7)	
Northern Pike	I	10.2 (1)	
	II	17.8 (3)	
	III	21.8 (4)	
Walleye	I	9.0 (2)	
	II	--	
	III	14.3 (1)	
	IV	15.3 (1)	
	V	-	
	VI	-	
	VII	-	
	VIII	-	
	IX	-	
	X	24.5 (1)	



Photo 1. Boat launch site for Five Channels Impoundment.



Photo 2. Typical dispersed camping site on Five Channels Impoundment in the Huron National Forest.





Photo 3. Typical riparian zone view for Five Channels Impoundment.



Photo 4. Upstream reaches of Five Channels Impoundment below Loud Dam.





Photo 5. View of main basin of Five Channels Impoundment.



Photo 6. Resident redhorse sucker species captured in Five Channels Impoundment.





Photo 7. Resident large common snapping turtle collected in Five Channels Impoundment.